



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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BOSTON, MA 02114-2023

**Memorandum**

**Date:** 6-18-07

**Subject:** Responses to National Remedy Review Board (NRRB) Recommendations for the Sutton Brook Disposal Area Superfund Site

**From:** Don McElroy, Remedial Project Manager  
Sutton Brook Disposal Area Superfund Site

**Through:** Bob Cianciarulo, Chief  
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Mike Jasinski, Region I Representative  
National Remedy Review Board

**To:** David E. Cooper, Chair  
National Remedy Review Board

EPA Region I has reviewed the recommendations of the National Remedy Review Board (NRRB) for the Sutton Brook Disposal Area Superfund Site (Site), as were documented in a memorandum dated May 30, 2007. Region I appreciates the Board's input and will incorporate the Board's recommendations into the Proposed Plan and Record of Decision, as appropriate. Specific responses to each of recommendation are outlined below. The NRRB's recommendations are in ***bold italics*** followed by the regional response.

Recommendation #1:

***The information presented to the Board did not include data concerning specific monitored natural attenuation (MNA) mechanisms that are affecting ground water contamination. The Region's decision to propose an MNA remedy should reflect understanding of the specific physical, biological, and chemical mechanisms being relied upon to achieve remedial action objectives for ground water (see "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites," April 1999, OSWER Directive 9200.4-17P). The Region should develop the information about the mechanisms of natural attenuation being relied upon and describe these in the decision documents, along with the measurable parameters that will be used to conduct periodic evaluations of the efficacy of the MNA remedy.***



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#### Response #1:

At the time the Region presented this site to the NRRB, the information regarding MNA as a component of this remedy was still being evaluated. Since that time, we have completed our review of the PRP group's evaluation of MNA in the RI/FS, and support its use as a portion of the preferred alternative, with a contingency to escalate to more active groundwater remediation if site-specific triggers, which would be outlined in the ROD, are exceeded.

In the Feasibility Study (FS), the PRP group provided evidence that it may be possible for MNA to work at the site. With the intended RA source control measures, lines of evidence will provide greater evaluation possibilities. The existing evidence presented included the following:

- Stabilization in concentrations or extent of the contaminant plume;
- Decrease in concentrations or extent of the contaminant plume; and
- Chemical footprints (electron acceptors, metabolic byproducts, etc.) demonstrating that intrinsic bioremediation is occurring.

Results presented show that the contaminant plume appears to be stable and that contaminant concentrations do not appear to be increasing. Chemical footprint indicators, including the absence of electron acceptors oxygen, nitrate, and sulfate and the presence (and subsequent increase spatially on-site) of metabolic byproducts methane and ferrous iron have been measured within and immediately downgradient of source areas on-site, indicating that biodegradation processes are interacting with contaminants in groundwater.

As noted in the OSWER Directive, a contingency remedy may be included in the ROD where there is uncertainty regarding a technology's performance. As outlined in the NRRB's recommendation, the ROD will articulate the mechanisms being relied upon for MNA and the parameters that will be used to evaluate the MNA component of the remedy and triggers for additional actions.

#### Recommendation #2:

***Monitored natural attenuation (MNA) is proposed as a remedial alternative by itself, and as part of a combined remedy, to treat subsurface contamination related to the Sutton Brook landfill units and former drum disposal area (FDDA). The review package reports that MNA will "actively reduce the toxicity, mobility, and volume of contaminants" in ground water and that there will be "no treatment residuals." However, the package also questions the effectiveness of MNA at the site: "At this time, the full effect of the natural attenuation, its effect on organic contaminants, and the net effect of the ground water environment on inorganic contamination, is not completely clear." Given the presence of multiple contaminants (organic and inorganic contaminants, transformation products, and naturally occurring compounds with the potential to be mobilized) and the variation in geochemical conditions across the site (e.g., anaerobic/aerobic conditions, presence/absence of certain electron acceptors,***

*presence/absence of certain levels of electron donors), natural attenuation processes will be very complex and rates of attenuation will be location and compound specific. Based on the limited information provided in the package, MNA has not been evaluated to the degree necessary to consider it as an appropriate remedy for the site. The Board recommends that the Region conduct a complete evaluation of natural attenuation at the site, for all contaminants of concern across the range of geochemical settings that could be encountered, before MNA is included as part of the preferred alternative.*

Response #2:

As outlined in the response to recommendation #1 above, the statements made regarding MNA during our presentation to the NRRB were based on an incomplete evaluation at that time. Since that time, we have completed our review of the PRP group's evaluation of MNA in the RI/FS, and support its use as a portion of the preferred alternative, with a contingency to escalate to more active groundwater remediation if site-specific triggers, which would be outlined in the ROD, are exceeded. A summary of the PRP group's evaluation is presented in the response to recommendation #1.

Recommendation #3:

*The preferred alternative includes MNA for several portions of the contaminated ground water following source control. The preferred alternative should clearly designate which areas will rely on MNA and describe a contingency for a more active remedial approach if MNA is not effective. The package did not include a discussion of triggers for invoking a contingency nor did it indicate the points of compliance for meeting ground water standards. The Board recommends that the Region evaluate appropriate definitions of success for MNA and what criteria would trigger more active ground water remediation. The decision documents should describe the contingent remedy that would be invoked or outline a process for its evaluation (e.g., focused feasibility study), and also should describe the points of compliance for meeting ground water standards, which as indicated in the NCP preamble (55 FR 8753, March 8, 1990) should be at the boundary of the waste management area.*

Response #3:

The Region's preferred alternative will include groundwater collection and active groundwater treatment in the area downgradient of the southern landfill lobe (prior to the brook) and MNA after source soil consolidation (landfill capping and FDDA soil consolidation) in other areas, with a contingency for more active groundwater remediation in these other areas, if warranted. The Region envisions establishing a number of "compliance wells" at the boundaries of each source area, at intermediate locations between the source areas and downgradient boundary lines, and at the downgradient boundaries. These locations would allow for monitoring of natural attenuation and source decay processes, as well as to monitor the concentration of constituents at these locations such that sufficient time would be allowed to evaluate and implement additional remedy components, if needed, to continue to meet the RAOs. Monitoring would be conducted prior to, during, and after source control construction

activities, and then periodically thereafter until cleanup goals are met. Specific evaluation process/criteria and/or triggers for moving to the contingent remedy would be outlined in the ROD. Criteria/triggers would include reduction in contaminant concentrations, plume extent, and chemical footprints, as described above in response to recommendation #1.

Recommendation #4:

***Based on the information provided in the package, it is unclear to the Board how the local geology and hydrogeology influence vertical and lateral contaminant migration. Of particular interest are the bedrock/till interface and potential DNAPL pathways. The Board recommends that prior to issuance of the decision documents, the Region evaluate whether further refinement of the geologic/hydrogeologic conceptual site model may be warranted. The Region can then determine whether the preferred ground water alternative will be sufficient to capture ground water contamination or whether the Region may want to modify the remedy to more effectively or efficiently capture ground water contamination. The Board also recommends that the decision documents describe the conceptual site model, including geological/hydrogeological aspects.***

Response #4:

Though perhaps not outlined in sufficient detail in the materials provided to the NRRB, the Region believes that the geologic/hydrogeologic conceptual site model is sufficiently developed to support a remedy decision at this time. The overall horizontal and vertical distribution of contamination has been shown to be constrained by the discharge of groundwater to Sutton Brook and its associated wetlands. Some uncertainty exists regarding exact flow paths as the plumes from the Southern Lobe and the Former Drum Disposal Area (FDDA) move into the wetlands and toward the brook, particularly in the area south of the FDDA. In this area, the brook has a low gradient and spreads out into the wetlands, while the aquifer reaches its maximum thickness along the path of the brook and includes a deep layer of coarse sand and gravel. Access for installing wells is limited due to the wetlands; however, it is likely that additional monitoring locations will be needed in this area to evaluate remedial actions. Additional evaluations may also be needed in other parts of the site during Remedial Design, to finalize vertical barrier design and groundwater extraction locations. The need for such additional studies will be prescribed in the ROD.

Recommendation #5:

***The package presented to the Board did not include an adequately detailed presentation of ground water treatment trains or discharge options for the proposed pump and treat remedies. The Board recommends that the decision documents include a discussion of the options being considered, along with appropriate pilot tests that may inform the choice among the options.***

Response #5:

The Feasibility Study being completed by the PRP group identifies a range of treatment and discharge options for active groundwater remediation. As noted in the NRRB comments, additional pre-design studies will be required to determine the appropriate technology or technologies to be implemented. The processes to be implemented are likely to include a combination of metals precipitation and advanced oxidation (e.g., via ozone, peroxide, or UV). However, during these pre-design studies, other technologies, such as, carbon adsorption and/or air stripping, as well as in-situ methods (chemical oxidation, enhanced bioremediation, etc.) will also be evaluated. Treated groundwater is expected to be discharged to the local publicly owned treatment works (POTW); however, on-site discharge to Sutton Brook (or other on-site location) will be evaluated as part of design. The ROD will outline the various processes and discharge options and prescribe pre-design studies needed to design and implement the appropriate technology or combination of technologies.

Recommendation #6:

***The material presented to the Board indicated that the vertical ground water barrier would be keyed to bedrock. The cost estimate was based on a 30-foot deep barrier. The Board recommends that the Region confirm the required depth and engineering during design to ensure that the barrier is keyed to a low permeability unit.***

Response #6:

The intent of the vertical ground water barrier being proposed is to ensure that groundwater from the southern landfill lobe would not impact Sutton Brook in the future. The type of impermeable vertical barrier (i.e., sheet pile, slurry wall, etc.) would be determined during the design phase based on site-specific details. During design, the required depth and engineering will be confirmed to ensure that the barrier is keyed to a low permeability unit or is sufficiently deep to alter groundwater flow as required by the remedy.

Recommendation #7:

***The Board agrees, based on the information in the package, that the RCRA Subtitle C cap requirements are ARARs. The Board recommends that decision documents specify that the cap meet the performance based standards of the subtitle C cap rather than specify a particular cap design.***

Response #7:

RCRA Subtitle C landfill performance standards will be included as ARARs for the capping alternatives. The design of specific landfill cover components to meet those performance standards will be determined during Remedial Design.

Recommendation #8:

***The package did not provide information on cleanup levels for the former drum disposal area soils, the garage/storage area, the sediment, or the wetland soils. The Board recommends that the Region develop cleanup levels and that the decision documents specify the numeric levels and their rationale.***

Response #8:

Preliminary Remediation Goals (PRGs) based upon the site-specific risk assessments and ARARs were still being developed at the time the Region made its presentation to the NRRB. Since that time, risk assessments have been completed and the ROD will clearly outline the various cleanup levels and their bases.

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